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# ENTOMOLOGICAL NEWS

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Juan Gundlach, 1810-1896.

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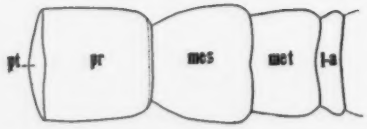


Fig. 1

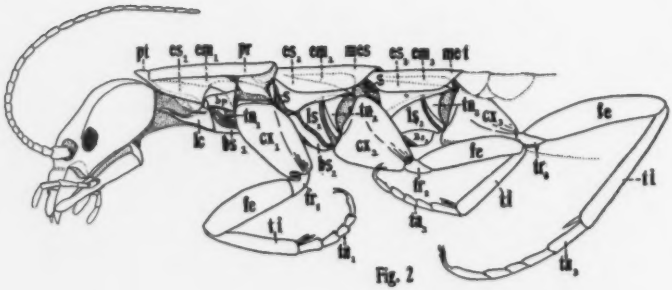


Fig. 2

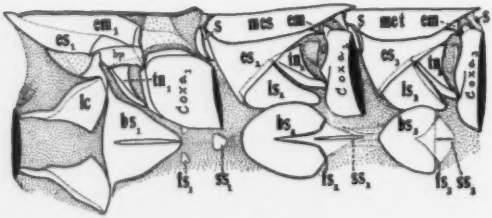


Fig. 3

GRYLLOBLATTA—CRAMPTON.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVI. OCTOBER, 1915. No. 10.


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## The Thoracic Sclerites and the Systematic Position of Grylloblatta campodeiformis Walker, a Remarkable Annectent, "Orthopteroid" Insect.


By G. C. CRAMPTON, PH.D.*


(Plate XIII)

In the March, 1914, issue of the *Canadian Entomologist* (Volume xlvi, No. 3, pages 93-99), Dr. E. M. Walker has described and figured a very remarkable insect, *Grylloblatta campodeiformis,* which combines within itself characters common to a number of "Orthopteroid" insects. Indeed, in many respects, it may be considered as a veritable "living fossil," and from the point of view of the study of insect phylogeny, it is one of the most important of recent pterygotan forms. Through the kindness of Dr. Walker, I have been able to make a study of the external anatomy of this important an-


*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

nectent insect, and would add the following details to the excellent general description he has already given of it.

In making a comparative morphological study of various insects in connection with the preparation of a paper dealing with the ancestry and affinities of the Hexapoda, it has become apparent that an attempt to trace the genealogy or relationships of insects largely through the study of their wing-venation is of little value. The study of no *one* structure or organ should be made the basis of such a work; and furthermore, the study of wing venation would be of no value in connection with larval forms, or with apterygote insects. In addition to this, some of the most important annectent forms (such as *Arixenia, Grylloblatta,* etc.) have lost their wings, and in such cases, a study of wing-venation would be quite useless. I have therefore laid greater emphasis upon the study of the head and terminal abdominal structures, and the thoracic sclerites (together with the parts of the legs), relegating the wing-venation to a position of secondary importance.

The accompanying figures of the thoracic sclerites of *Grylloblatta,* are of necessity somewhat "diagrammatic," since it was not always possible to clearly distinguish the outlines of the plates in a delicate insect which had been allowed to dry before it was placed in alcohol; and fear of injuring a valuable specimen prevented a thorough examination of parts concealed by overlapping structures. Subsequent examination of specimens preserved in alcohol, however, will, I think, demonstrate that the figures here given, are in the main correct. The terminology here employed, is that used in former papers dealing with the comparative anatomy of the thoracic sclerites (*e. g.* "Notes on the Thoracic Sclerites of Winged Insects:" *Entomological News,* Vol. xxv, Jan. 1914, pages 15-25).

The thorax of *Grylloblatta* presents a curious combination of characters also found in the Dermaptera, Isoptera (which are related to the Dermaptera as well as to the Blattids) and Gryllidae. As shown in Pl. XIII, Fig. 1, the outline of the pronotum (*pr*), mesonotum (*mes*) and metanotum (*met*) is quite like that of the nota of such wingless Dermaptera as

*Anisolabis;* the relative size of the nota is much the same as in *Anisolabis*, and the anterior sclerite *pt* (Fig. 1) is apparently also represented in the pronotum of the Dermaptera. The fact that the pronotum (*pr*, of Fig. 2) does not overlap the pleural region to any extent, while the mesonotum (*mes*) and metanotum (*met*) do overlap the pleural region, is strongly suggestive of the condition found in *Anisolabis;* and, indeed, the dorsal sclerites of *Grylloblatta* are more nearly like those of wingless Dermaptera than any other insects which I have examined.

The pleural region of the thorax presents some characters suggestive of the Dermaptera, and also of the Gryllids, but on the whole, the pleural region is more like that of the Isoptera than any other insects. The prothoracic episternum (*es*, Figs. 2 and 3) and epimeron (*em*) are much like those of the Dermaptera, but the presence of the clearly demarked sclerite *bp* is a feature which does not occur in any of the pterygote insects which I have studied, and is suggestive of the condition found in apterygote forms. The lateral cervicals (*lc*, of Figs. 2 and 3) are not divided into a number of smaller plates as in the Dermaptera, but rather resemble those of the Gryllidae, and even slightly resemble those of the Isoptera, except that they do not meet in the mid-ventral line as in the Isoptera and are not subdivided as in the latter insects.

The episterna and epimera (*es* and *em*) of the meso- and metathorax are quite like those of the Dermaptera, and are likewise somewhat similar to those of the Isoptera (which also resemble the Dermaptera). The "laterosternite" *ls* (Figs. 2 and 3) occurs in the mesothorax of the Dermaptera and Gryllidae, but in the metathorax of these insects it is indistinguishably united with the sternal region. Only in the Isoptera is the sclerite *ls* present as a distinct plate in both meso- and metathorax, as is also the case in *Grylloblatta*. The shape of the trochantin, *tn* (Figs. 2 and 3), and its division into an anterior and posterior region by an oblique suture, is characteristic of the Isoptera (and also of the Blattidae, to which the Isoptera are nearly related).

The fact that the sterna are widely separated, is characteristic of the Isoptera; and the triangular outline of the prosternum (*bs*[1], Fig. 3) is also strongly suggestive of the Isoptera. The smaller sternal sclerites *fs* and *ss* were very hard to distinguish, and I am not certain that their outlines are correctly portrayed, but as far as I could make out, they seem to resemble those of the Isoptera. The larger sternal plate, *bs*, of the meso- and metathorax is unlike that of any other insect I have examined.

The coxae (Fig. 2, *cx*) are extremely like those of the Isoptera, save for the fact that the meso- and metathoracic coxae of *Grylloblatta* are not divided by a vertical suture into two parts, as in the Isoptera, and in this respect they are more similar to the meso- and metathoracic coxae of the Blattidae. The trochanters are similar to those of the Isoptera and Blattidae. The femora on the other hand are strikingly similar to those of the Dermaptera. The tibiae also resemble those of the Dermaptera, somewhat, although certain features present in them are suggestive of the Isoptera and Blattidae. The four basal tarsal segments are as much like those of the Blattidae as any, but the terminal tarsal segment is surprisingly like that of the Dermaptera not only in shape but also in the absence of pulvilli, and in the character of the claws it bears.

It is therefore apparent from the study of the thoracic sclerites, that the Grylloblattidae combine in themselves characters which occur in the Dermaptera, Isoptera (and the closely related Blattidae) and Gryllidae. There are also certain features, which "presage" (so to speak) some of the characters which reach a fuller development in the crickets and katy-dids. It would be impossible, however, to form any definite conclusions concerning the affinities of the Grylloblattids from the study of the thoracic structures alone, and it is therefore necessary to take into consideration the head and terminal abdominal structures as well. (The ideal method would be to make a comparative study of the internal structures, the embryological development of the various organs, etc., in addition to the study of the external morphology, but in this case, such an

extended study is impossible, from lack of material). Before attempting to point out the relationship of the Grylloblattidae to the neighboring groups of insects, however, it will be necessary to briefly discuss the systematic position of these related groups, in order to more readily appreciate the meaning of the mutual resemblances of several of these groups, and to realize the significance of the combination of characters found in the annectent Grylloblattidae.

The two groups of pterygote insects which seem to have departed the least from the ancestral type, are the Plecoptera and the Blattidae. Certain Plecoptera nymphs are strikingly similar to the Lepismatidae, not only in their general "habitus," but also in various morphological details, such as the structure of the antennae, mouthparts, prothoracic sclerites, etc.; and in the same way, the Blattidae are strikingly similar to the Lepismatidae. Indeed, the resemblances between these immature Plecoptera (or the Blattidae) and the Lepismatidae are far greater than those between the Plecoptera (or Blattidae) and the higher pterygote insects such as the Diptera, Lepidoptera, etc. It would therefore appear to be very probable that the Plecoptera, Blattidae, and Lepismatidae (i. e. *Lepisma, Nicoletia,* etc.), are closely related, and doubtless sprang from very similar ancestors (i. e. from ancestors which would doubtless have been grouped into a single order, or possibly a single family).

Very closely related to the Plecoptera, on the one side, are the Embiidae; while on the other, the Plecopteron line of development is very closely paralleled by that of the Dermaptera. Indeed, such forms as *Arixenia* (specimens of which were kindly loaned me by Dr. K. Jordan), combine in themselves characters found in both Plecoptera and Dermaptera, and the immature stages of such Dermaptera as *Dyscritina, Karschiella, Bormansia,* etc., in which the forceps are preceded by Plecopteron-like cerci, serve to connect the Plecoptera and Dermaptera—or rather, they indicate a common origin for the two lines of descent.

The character of the antennal segments, the shape of the head, the nature and position of the eyes, the general shape of the mouthparts, many of the thoracic sclerites, certain of the leg structures, and many other features indicate that the Grylloblattids are very closely related to the Dermaptera. Furthermore, the fact that in the immature stages the previously mentioned Dermaptera have segmented cerci (which later become modified to form the forceps) clearly indicates that the Dermaptera are the descendants of forms having segmented cerci similar to those of the Plecoptera. The presence of segmented cerci (which are quite similar to those of immature *Karschiella*) in the Grylloblattidae, therefore, instead of militating against the view that the Grylloblattidae are closely related to the Dermaptera, would, on the contrary, indicate a community of descent between the two groups; and would simply show that the Grylloblattidae have departed less from the common ancestral type in this respect, than have the Dermaptera—and, indeed, the Grylloblattidae are more "primitive" in many other respects than the Dermaptera are. On the other hand, the presence of a well-developed ovipositor in the Grylloblattidae, might be regarded as a more highly specialized feature (although the fore-runners of ovipositors are to be found in *Lepisma, Machilis,* and other primitive insects). This however, does not affect the general primitive character of the Grylloblattidae, since it is a matter of common occurrence that animals which are very primitive in some respects, may develop certain other highly specialized features.

The Isoptera have apparently descended from ancestors having segmented cerci also, and, indeed, the cerci of *Archotermopsis* are composed of exactly as many segments as those of *Grylloblatta*—namely, eight. I had long suspected that the Isoptera were rather closely related to the Dermaptera (as well as to the Blattidae) and upon examining the various structures of *Grylloblatta,* it at once became apparent that we have in the latter insect a form annectent between the Dermaptera and the Isoptera (and leading to the crickets and katydids). I am convinced that *Grylloblatta* is descended from an-

cestors very like those of the Isoptera and Dermaptera (with the Plecoptera), and although *Grylloblatta* is much nearer to the Dermaptera than to the Isoptera, it furnishes a "connecting link" between the two. As will be later discussed, *Grylloblatta* also leads us to the common origin of the crickets and katydids.

The Coleoptera also combine certain features found in the Dermaptera and Isoptera, but doubtless are descended from ancestors nearer to the Dermaptera than to the Isoptera. The fact that some beetle larvae have forceps-like terminal abdominal appendages (e. g. *Cucujus, Pyrochroa,* etc.), while others, such as the Carabidae, have segmented cerci, was for a long time a very puzzling feature in attempting to determine the ancestry of the Coleoptera; but in the light of what has gone before (namely that the forceps of the Dermaptera are merely modifications of the segmented cerci of the ancestral forms) the occurrence of both forceps and segmented cerci in beetle larvae becomes immediately comprehensible, and takes its logical position in the general developmental scheme.

Very closely related to the Isoptera, are the Zoraptera recently described by Silvestri, 1913 ("Descrizione di un nuovo ordine di insetti," Portici, 1913). I have not been able to obtain any of these insects for examination, but it is quite evident that they are very closely related to the Isoptera, and also show certain Coleopterous affinities. Whether they are annectent between the Isoptera and any other group, can only be determined by a closer examination of the thoracic sclerites, etc., which are not clearly shown in Silvestri's figures; but I would not be at all surprised if they should prove to possess characters similar to the Grylloblattidae (and Dermaptera) also.

The Isoptera, as has been previously mentioned, are related to the Grylloblattidae and Dermaptera. They are also closely related to the Blattidae, perhaps more closely than to the Grylloblattidae, and thus occupy a position between the two. The Blattidae, on the other hand, are very closely related to the Mantidae. The complicated interrelations of these various

forms makes it impossible to arrange the orders in a dichotomously branching phylogenetic tree, since such an arrangement does not show the fact that several of the groups may overlap or approach one another from different directions, but merely allows for the branching in one plane.

As was previously mentioned, the Grylloblattidae occupy an intermediate position between the Dermaptera and Isoptera, and apparently branched off at an early stage from the ancestral Dermaptera-Plecopteron group. The tendency toward the development of an ovipositor (present in other primitive insects) has apparently found opportunity for expression in the Grylloblattidae, and in the crickets and katydids, which are descended from ancestors not unlike the Grylloblattidae. Indeed, the terminal abdominal structures of such crickets as *Oethancus* are strikingly similar to those of *Grylloblatta,* and the fore-runners of many structures which reach their greater development in the crickets and katydids are clearly evidenced in the Grylloblattidae. The crickets and katydids approach one another in such forms as *Gryllacris,* and have apparently descended from a common stock. This common stock, in turn, was derived from forms not unlike the Grylloblattidae—in other words, the Grylloblattidae have not greatly changed from the ancestral forms, although they, of course, have developed modifications of their own, as is true of all forms now living.

I have not seen such forms as *Phasmodes, Zaprochilus,* etc., but judging from the figures by Caudell, 1912 ("Orthoptera," family "Locustidae;" *Genera Insectorum,* fascicle 138), *Phasmodes* is an insect allied to the katydids, and related to both Phasmidae and Grylloblattidae. The Phasmidae, on the other hand are related to the Phylliidae (*Phyllium*-like insects), and the latter (Phylliidae) are in reality nothing but greatly flattened, walking grasshoppers!

The line of descent of the grasshoppers ("Acridiidae") is, I think, slightly different from that of the crickets (Gryllidae) and katydids ("Locustidae"), although it closely parallels the latter line. Judging from the antennae, mouthparts, thoracic sclerites, the nature of the "ovipositor," etc., the grasshoppers are in some respects more closely related to the Phylliidae than

to the "Locustidae" and Gryllidae. The fact that the "Acridiidae" Gryllidae and "Locustidae" are all saltatorial should have no great weight, for on this basis, we would have to group together the flea-beetles, Psyllidae, and any other forms which happened to have developed the power of leaping. The saltatorial habit is a purely physiological one, and should not have the weight of a fundamental structural resemblance, as will be elsewhere discussed.

There is apparent in many Phasmids, particularly the tropical forms from India, etc., a marked tendency toward the development of (or the retention of) an ovipositor, and forms such as *Phasmodes* and *Zaprochilus* seem to indicate a rather close relationship between the Gryllid-"Locustid" group (which is an ovipositor-bearing one) and the Phasmidae. On the other hand, forms such as *Timema* (specimens of which were kindly loaned me by Mr. Caudell) seem to point to a relationship between the Phasmidae and the Plecoptera-Dermapteron group, and hence with the Grylloblattidae. The relationship between the Phasmidae and Grylloblattidae, however, is more direct than through the mediation of the Plecoptera-Dermapteron group, and, in all probability, the Phasmidae and Grylloblattidae arose from very similar ancestors.

On the other hand, the Phasmidae and Mantidae are very closely related, and I must confess that the complicated interrelations of these lower groups is a very puzzling feature. Thus some Mantid-like forms such as *Mantoida* are very Neuropteron-like, and even resemble the aberrant Panorpid *Merope*. This, however, may be explained by the fact that the Neuroptera, Plecoptera (Dermaptera, etc.), Mantidae, Phasmidae, etc., all sprang from very similar (closely related) ancestors; and it is therefore to be expected that mutual resemblances would be retained by some members of each group.

The Psocidae are regarded by many recent investigators, as very near to the Isoptera and Plecoptera (with the Embiidae) —and therefore to the Grylloblattidae. I do not entirely agree with this view, however. The Neuroptera have departed but little from the ancestral group whence sprung the Trichoptera and Lepidoptera, the Mecoptera, Diptera and Siphonaptera,

and the Hemiptera-Homoptera, and it is with the *Neuroptera* and *Homoptera* that the Psocidae show the closest affinities. It is quite true that the ancestral Neuroptera very closely approach the ancestral Plecoptera, and in this way the Psocidae would be related to the Plecoptera and Isoptera, but the relationship is a rather indirect one, and, as has been stated, the affinities of the Psocidae are rather with the Homoptera and Neuroptera, than with the Plecoptera and Isoptera.

The complicated inter-relations of the various orders of insects makes it extremely difficult to arrange them in clearly defined groups. There are, however, at least two clearly defined "nuclei," or centers, about which the majority of pterygotan insects group themselves; further investigation will doubtless disclose other such centers. The two centers in question are the Neuroptera and the Plecoptera, and the ancestors of both of these groups were, in all probability, derived from forebears similar enough to be grouped into a single family.

The insects which group themselves about the "Neuropteron-center" constitute a supersection which may be referred to as the **Neuropteradelphia** (or "Neuropteron-brotherhood"), and all are the descendants of very similar ancestors—i. e., their ancestors would have been grouped into a single family. Here belong the following orders: Neuroptera, Trichoptera, Lepidoptera, Mecoptera (Panorpidae), Diptera, Siphonaptera, Homoptera, Heteroptera. Clinoptera (Psocidae), and others.

The insects which group themselves about the "Plecopteron-center" constitute a second supersection which may be referred to as the **Plecopteradelphia** (or "Plecopteron-brotherhood"), and all are the descendants of very similar ancestors. Here belong the following orders: Plecoptera, Platyptera (restricted to the Embiid-like insects), Dermaptera, Notoptera (Grylloblattid-like forms), Zoraptera, Isoptera, Cheleutoptera (Phasmid-like forms), Phylloptera (*Phyllium*-like forms), Diphtheroptera (grasshopper-like forms), Orthoptera ("Locustidae" and Gryllidae), and others.

The orders Palaeoptera (Blattid-like forms) and Dictyoptera (restricted to the Mantid-like forms) are very closely

allied, and may possibly be grouped into a third supersection, the **Palaeopteradelphia**. I am inclined, however, to include them in the Plecopteron group, since the Blattidae are closely related to the Isoptera, and also resemble certain Plecopteron nymphs.

Many pterygotan orders of doubtful origin (such as the Hymenoptera, Mallophaga, etc.) have been omitted from the foregoing discussion. It may be remarked, however, that the Hymenoptera very probably arose from ancestors not very unlike those of the Isoptera and Notoptera (Grylloblattidae), and would therefore be included in the Plecopteron group. This point, however, can be decided only after a more extended study of the Hymenoptera, and an examination of intermediate forms not at present accessible.

It will be noted in the foregoing discussion, that the Grylloblattidae are grouped into a distinct order, the **Notoptera** (a term signifying that the wings have been superseded by prolongations of the notum), and this, I think, is fully justifiable, if such groups as the Isoptera, Dermaptera, etc., are also to be considered as distinct orders. In no other group of insects do we find a combination of segmented cerci, ovipositor, broad coxae, five-segmented tarsi, divided trochantin, laterosternite (plate *ls*, of Figs. 2 and 3), distinctive sterna, etc., etc., which is characteristic of the "Notoptera," and clearly demarks the order from all others.

It will also be noted that the *Phyllium*-like insects have been grouped into a separate order, the **Phylloptera** (or "leaf-winged" insects). These are differentiated from other insects by the flattened condition of the body, together with the great reduction of the hind wings, the reduced and flattened antennae, the broad sternites, with peculiar pleural sclerites somewhat resembling those of the grasshoppers (yet are folded upward and "mesal-ward" in a distinctively characteristic fashion), the greatly reduced "cerci," flattened and greatly modified "ovipositor," etc.

The Phasmid-like forms and the Phylliidae are usually grouped by recent investigators, into a single order termed the

Phasmoidea. I quite agree with Shipley, 1904 ("The Orders of Insects," Zool. Anz., Vol. 27, pp. 259-262), however, in his contention that the terms applied to the orders of pterygote insects should always end in "-ptera," for the sake of uniformity. Since the term Phasmoidea does not end in "ptera," I would substitute for it the designation **Cheleutoptera** (referring to the folding of the hind wings in longitudinal plaits, when at rest), and would also remove the Phylliidae from the "Phasmoidea," and place them in a separate order, the Phylloptera.

The grasshoppers differ from the remainder of the "Saltatoria" in that the ovipositor is short, the cerci are greatly reduced, the sterna of the meso- and metathorax instead of being separate, are closely united and interlock (or are "dove-tailed") in a peculiar fashion, there is no plate (the laterosternite) between the mesothoracic sternum and pleural region as in the other forms, a single pulvillus (absent in the other forms) occurs between the tarsal claws, the labium and other mouthparts are different from those of the other forms, as is true of the antennae (which are short, and have segments of a different character), etc., etc. I have therefore placed the grasshoppers in a different order, which I would call the **Diphtheroptera** (or "leather-wings," referring to the nature of the tegmina).

The crickets and katydids form the greater part of the order "Orthoptera" (in the restricted sense), and compose its two principal suborders. The crickets form a distinct suborder, the **Gonioptera** (so-called from the fact that the lateral portion of the tegmina is bent downward and forms an angle with the upper portion of the tegmina); and the katydids form another well-defined group, which may be called the **Phytoptera** (from the resemblance of the wings to parts of the plants). The Gryllotalpidae possibly form another suborder, the **Paraphytoptera**, intermediate between the other two; but this point needs further investigation. The *Phasmodes*-like forms are sufficiently different from the other katydids to form a distinct suborder—if not a distinct order; which may be designated as the **Protophytoptera**.

The Blattidae and Mantidae are classed as distinct orders by certain recent investigators (Handlirsch, etc.) and very rightly so, but the terms Blattoidea and Mantoidea, applied to these orders, do not end in "-ptera," as they should do, for the sake of uniformity. I would therefore substitute for "Blattoidea," the designation **Palaeoptera** (referring to the ancient character of the wings), and for Mantoidea, I would substitute the older designation Dictyoptera (used in the restricted sense).

The Hemimeridae are regarded by some investigators as related to the Blattidae, but Verhoeff has correctly classed them with the Dermaptera, and regards them as a suborder, to which he applies the designation Dermodermaptera. The Arixenidae are also to be regarded as aberrant Dermaptera, and form a suborder which may be called the **Plecodermaptera**, from their resemblance to the Plecoptera.

## Summary.

The principal points brought out in the foregoing discussion may be briefly summarized as follows:

(1) The thoracic structures of the Grylloblattidae present a combination of characters found in the Dermaptera, Isoptera and Gryllidae.

(2) The Grylloblattidae constitute a distinct order, the Notoptera.

(3) The Notoptera occupy a position intermediate between the Dermaptera and Isoptera, and are the nearest living representatives of the common ancestors of the Gryllidae and "Locustidae" (Tettigonidae).

(4) The Platyptera (Embiidae), Plecoptera, Notoptera and Dermaptera are very closely related, and sprang from ancestors so similar that they would have been grouped in a single family, or subfamily.

(5) There are at least two (possibly more) centers about which pterygote insects group themselves, namely, the Plecoptera and the Neuroptera. The ancestors of both probably sprang from a common stock.

(6) The Plecoptera (certain immature forms) and Palaeoptera (Blattidae) are strikingly similar to the Lepismatidae, and the ancestors of all three must have been very closely related.

EXPLANATION OF PLATE XIII.

Fig. 1. Terga of pro-, meso- and metathorax and first abdominal segment, seen from above.

Fig. 2. Lateral view of anterior portion of the insect. Only the basal portion of the abdomen is shown (as dotted lines). The position of the episternum and epimeron (of meso- and metathorax) indicated by dotted lines, to indicate that they lie below the overlapping terga.

Fig. 3. Ventral view, showing sternal plates and one side of the body. All are represented as though stretched out in one plane.

All figures are of *Grylloblatta campodeiformis* E. M. Walker. The figures are somewhat diagrammatic.

*Abbreviations.*

*1-a*—First abdominal tergite.
*bp*—Basal pleural sclerite.
*bs*—Basisternite (largest sternite).
*cx*—Coxa.
*em*—Epimeron.
*es*—Episternum.
*fe*—Femur.
*fs*—Furcasternite (in two parts in prothorax).
*lc*—Lateral cervical sclerites.
*ls*—Laterosternite.
*mes*—Mesonotum.
*met*—Metanotum.
*pr*—Pronotum.
*pt*—Pretergite.
*s*—Spiracle.
*ss*—Spinasternite.
*ta*—Tarsus.
*ti*—Tibia.
*tn*—Trochantin.
*tr*—Trochanter.

The subscripts 1, 2 and 3 indicate that the structure in question belongs to the pro-, meso- or metathorax.

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### Two New Names in the Ascalaphidae (Neur.)

The genus *Ptynx* Lefev. was proposed with *costatus* Burm. as only species; this species was already the type of *Haploglenius*, so that *Ptynx* Lefev. is a synonym of *Haploglenius*. *Neuroptynx* McClend. was proposed to replace *Ptynx* (*preoc.*), and so also falls as synonym of *Haploglenius*. Therefore, I propose **Ascaloptynx** n. n. with the generic characters assigned by Weele for *Neuroptynx*, with *Ascalaphus appendiculatus* Latr. as its type.

The genus *Orphne* Lefev. (Agassiz gives *Orphnus* also *preoc.*) was proposed for *Ascalaphus appendiculatus*, but is preoccupied by Hübner. *Orphne* as used by MacLachlan and Van der Weele is thus without a name, and MacLachlan was aware that he was using the name in a wrong sense. Therefore, I propose **Ascalorphne** n. n. with the generic characters usually assigned to *Orphne*, and with *Ascalaphus macrocercus* Burm. as its type.—NATHAN BANKS, East Falls Church, Virginia.

## The Urgent Need of the Economic Entomologist.

By A. A. GIRAULT, Washington, D. C.

My experience as an economic entomologist has taught me that when a man of science is in a position where he is expected to be practical in the ordinary meaning of that word, either he or the public has to surrender. The so-called practical man is too often just the opposite as I am reminded by a conversation which I once had with a farmer. This man was thought to be very practical; he had a large farm which was *profitable*. He was a man of affairs and family. As a practical man, he became interested in a certain insect which was causing him considerable loss from year to year. He made it an object of his business and for many years experimented with various operations and objects and so obtained a large experience in dealing with the insect. I visited him especially for this reason as I hoped to obtain the results from all these years of experiment and experience. I was greatly surprised, however, to find that there had been *none*. In the course of the conversation this eminently practical man intimated to me that, though he was a practical man, he was not a writer, meaning to show, I suppose, his contempt for such an impractical operation. He gave me various accounts of his experiments but it needed no acumen to see that they had long since been lost to him and that he was totally confused. This eminently practical man could not perceive his own impracticality in not making use of the art of writing.

We see then that the word *practical* has a somewhat false meaning in popular use. To expect a scientist to be thus practical is like expecting him to renounce himself together with all of those aids which the really practical sense of man has laid up in store for his *proper* use. I have in mind theories, books and mechanical appliances. All are greatly abused and most are worthless. A small minority are invaluable and true. Practicality in life is shown by the use of those aids made by the individual, his selection of the worthy and rejection of the false.

It is so with the economic entomologist. Primarily he should know biology; he should be conversant with the accepted theories or truths, the broad general descriptions or laws of life; he must be practical in the use of literature, meaning by that discriminating; he should have had actual experience with many kinds of plants and animals, for upon his experience combined with his capacity will depend his entire practicality, his whole education, his character. He must, of course, have had a large experience in dealing with insects and their control. In a word, he should be truly educated, which means self-developed, learning from experience, accepting all of the aids within his reach toward that end but with discrimination.

Economic entomology should be considered as being within the broad field of applied biology, including medicine and agriculture in their widest sense. But, fundamentally, it is pure biology, and therefore pure science and the efforts of the layman for profit to make of the economic entomologist a creature belonging to him and a practical man in the ordinary sense cannot result in anything else than loss to both, for the economic entomologist must be fundamentally a biologist studying insects and a biologist cannot be prostituted for gain without hurt to himself. As a necessity, he cannot safely for gain or for any other object whatsoever, prostitute his own mentality in order to satisfy *current* or *local views* regarding what is practical. Thus we come to one of the crying needs of the economic entomologist—that he should become no less than theoretical.

In applied entomology it is almost trite to state that a *true* knowledge of the habits, instincts and home relations of insects is the basis for all operations against them. Yet, how few insects have been carefully and thoroughly studied. The absence of knowledge concerning some particular habit often results in failure to cope with the insect, while the absence of theories concerning the home relations of insects often leads to faulty recommendations which may cause loss in one way or another. If economic entomology was on a broad biological

basis, that is, theoretical, there would be less uncertainty concerning the application of parasitology and more certainty regarding the importance of local conditions in causing variation in the life histories of insects. Nothing that is true is impractical; its practicality may not be seen at the time, but in the end all knowledge becomes of use, directly or indirectly. Of all knowledge, the theoretical is the most practical and I have no doubt that as soon as the economic entomologist becomes theoretical, immediate practical results will be forthcoming and new fields of prophylaxis and treatment opened.

## Preliminary Notes on Iowa Pentatomoidea (Heterop.).

By DAYTON STONER, State University of Iowa, Iowa City, Ia.

During the summer of 1914 advantage was taken by the writer of visiting various parts of the State of Iowa for the purpose of collecting insects and in the course of these trips a few species of Pentatomoidea heretofore unrecorded from the State were secured. Some new host plants for species that have been recorded also were noted and some further records of local abundance and distribution were obtained.

As only a very little has been recorded on this group for Iowa since Herbert Osborn's work of more than a decade ago, it was thought that notes on some of the species might be of interest at this time. The following data are in no way complete and represent only a brief preliminary account of a more extensive study which is now being undertaken on this group and which, it is hoped, will be completed in the near future.

Thus far in the work, collecting has been done in northeastern Iowa, commonly designated as the "driftless area" of the State, and also in the north central and south central counties. No collecting has been done in southeastern Iowa and only a very little west of Des Moines. Both the southeastern and the western parts of the State should yield some interesting forms and a more complete knowledge of the status of the Pentatomids in Iowa should be available after another season's collecting.

So far as the writer is able to determine, 51 species of Pentatomoidea had been recorded from Iowa up to 1898 by Osborn, and since that time but one additional record has been published. Of these 52 species the material now at hand represents 38 species and an additional 5 species which have not before been recorded. Not all the recorded species are mentioned in the following list, those only being included which may be of particular interest. The new records are also indicated in these notes.

### Family CYDNIDAE

#### Subfamily THYREOCORINAE

**Thyreocoris pulicaria** Germar. This is the most common species of the family and has been taken in practically every locality visited. At Ames it has been taken in June in great numbers from potato and some damage to the plants may be attributed to it.

**Thyreocoris unicolor** Beauv. This species has not before been recorded from Iowa, but of the members of the genus it is surpassed in abundance only by *T. pulicaria.*

#### Subfamily CYDNINAE

**Sehirus cinctus** Beauv. This species, heretofore unrecorded from Iowa, has been found in but two localities and apparently is nowhere common. A single specimen was taken in July at Grinnell on wild raspberry. At Iowa City the species has been taken in March from under boards and sticks in a field that had been used as a pasture during the previous season.

### Family PENTATOMIDAE

#### Subfamily PENTATOMINAE

**Coenus delius** Say. Widely distributed but nowhere common. Taken in timothy and clover fields. Also found hibernating under sticks and dry weeds in late March and early April.

**Euschistus tristigmus** Say. Only fairly common; found usually on hazel. A single hibernating form also has been found.

**Euschistus variolarius** Beauv. Next to *Peribalus limbolarius* this seems to be the most common species of Pentatomid met with in the State. A number of hibernating specimens have been found.

**Hymenarcys aequalis** Say. Of this species Osborn says, "Not common." Fifty specimens are in our collection from the following localities: Iowa City, Bayfield, Monticello, Hampton, Indianola and Corydon. We have found the species in practically every month of the year and it is a common hibernating form.

**Hymenarcys nervosa** Say. Less common than *H. aequalis.* Commonly found hibernating under boards and weeds in pastures.

**Murgantia histrionica** Hahn. This species was first recorded from the State by the writer in 1912 (Ent. News, xxiv, 132, 1912), but since that time, although careful search has been made in a number of localities, other specimens have not come to light.

**Neottiglossa sulcifrons** Stal. Not before recorded from Iowa. One specimen from Chariton in the south central part of the State.

**Neottiglossa undata** Say. Of this species Osborn says, "Not common." The writer has many specimens from several localities, thus indicating that it is at least fairly common. The following field note will give some idea of its abundance at Ames: "7th July, 1913; this species (*N. undata*) very common along roadsides just south of the West Side at Ames, Iowa. Collected 30 specimens and as many more could easily have been secured * * *." The species has also been taken on mullein.

**Chlorochroa persimilis** Horv. Not before recorded from Iowa. Apparently it is not abundant and is common only locally.

**Peribalus limbolarius** Stal. This is the most common species of Pentatomid found in the State.

**Solubea pugnax** Fabr. This species has been taken only once, September, Iowa City.

**Thyanta custator** Fabr. We have found this pretty green species in practically everyone of the thirty-four counties visited in the State during the past summer. It seems most abundant in rank growths of timothy and red clover. A number of specimens are of a yellowish green or reddish brown color and in no case do these specimens have the sanguineous band on the pronotum. On many of the typically colored green specimens this band is also lacking.

**Brochymena annulata** Fabr. Not common; specimens at hand from Iowa City only.

**Brochymena arborea** Say. More common than the preceding species; collected on wild crab apple.

**Brochymena quadripustulata** Fabr. The most common species of the genus, but it has not before been recorded from Iowa. On one occasion it has been found hibernating under oak leaves at the edge of a woods in early April.

Subfamily GRAPHOSOMATINAE

**Podops cinctipes** Say. Not common and found in but three localities, Iowa City, Davenport and Chariton, and all south of the center of the State.

Subfamily ASOPINAE

**Apeteticus cynicus** Say. Taken on wild cherry; east central Iowa.

**Apeteticus maculiventris** Say. A fairly common species in almost every locality.

# A new Species of Campoplex (Hym., Ichneumonidae).

By HENRY J. FRANKLIN, Superintendent of the Cranberry Station of the Massachusetts Agricultural Experiment Station, East Wareham, Mass.

**Campoplex variabilis n. sp.**

♀—Length 8 mm.; greatest diameter of lateral ocelli of approximately the same length as the shortest distance between those ocelli and the nearest eye-margin.

Head and thorax black and thinly clothed with silvery pubescence. Abdomen with first segment black; second dorsal segment dark brown, but shading into ferruginous toward the apical margin; second ventral segment entirely stramineous; third and fourth segments entirely ferruginous; fifth segment with basal portion ferruginous and apical part black, the line of demarcation between the two colors being very irregular and rather indefinite; the remaining segments entirely black.

Antennae dark brown. Mandibles dark, but slightly tinged with reddish brown. Palpi dark brown. Tegulae dark brown. All the coxae and trochanters black; front femora mostly yellowish-ferruginous, but somewhat darkened toward their bases; middle femora dark brown for the most part, but light ferruginous or stramineous apically; fore tibiae and tarsi stramineous; middle tibiae stramineous, but somewhat darkened toward their bases; middle tarsi dark; hind legs entirely dark. Wings hyaline and slightly darkened.

*Type*.—The specimen from which the above description was made came from Wareham, Massachusetts, and is deposited in the collection of the Massachusetts Agricultural College. This specimen and six others of the same species were bred by the writer from the larvae of *Epelis truncataria* var. *faxonii* Minot, from 25 to 30 per cent. of the *Epelis* larvae being infested with this parasite. They emerged from their host larvae and formed their cocoons between July 23 and August 8, 1913. The cocoons were elliptical in shape and coffee-brown in color and ranged from 6.5 mm. to 7.5 mm. in length. The adult parasites emerged on dates ranging from June 12 to June 27, 1914. These specimens showed much variation in coloration, and three color variants based on this variation are here described:

*Color Variant* 1.—Like the typical form, but with entire apical half of second dorsal abdominal segment ferruginous, basal two-thirds of fore femora darkened, middle femora entirely dark, basal halves of middle tibiae dark, and apical segments of fore tarsi brown.

One specimen, deposited in the collection of the Massachusetts Agricultural College.

*Color Variant* 2.—Like the typical form described above, but with mandibles for the most part stramineous, palpi dark stramineous, tegulae stramineous, apices of fore coxae touched with stramineous, fore trochanters and femora entirely stramineous, middle tarsi mostly stramineous, but their apical segments brown.

One specimen, deposited in the collection of the Massachusetts Agricultural College.

*Color Variant* 3.—Like Color Variant 2, but with distal half of middle femora stramineous, middle tibiae entirely stramineous, and hind tibiae considerably stramineous along their front sides except at base and apex.

Two specimens, one of which is deposited in the collection of the Massachusetts Agricultural College.

This very variable species may grade into forms heretofore described, but, as its relationships are unknown and as it seems necessary to establish its identity in connection with the writer's cranberry insect investigations, it is here described as new. Moreover, the detailed description of so great variation as is shown by these specimens is always desirable.

## Boisduval's Lycaena piasus and Lycaena rhaea (Lep.).

By J. R. HASKIN, Los Angeles, Cal.

Two very interesting series of notes have recently been published concerning M. Charles Oberthür's figures of the Boisduval types of North American Lycaenidae. One of them is entitled "Lycaenidae of California Described by Boisduval," by William Phillips Comstock, in the *Journal of the New York Entomological Society*, Vol. xxii, No. 1, March, 1914, and the other is entitled "Notes on the Synonymy of Boisduval's N. American Species of Lycaenidae," by J. McDunnough, Ph.D., in the *Entomologist's Record and Journal of Variation*, Vol. xxvi, No. 9, September 15, 1914, in London, Eng. Messrs. Comstock and McDunnough, after an examination of Oberthür's figures, have both come to the conclusion that American entomologists, during the past fifty years, have

wrongly identified *L. piasus*. According to the Oberthür figure *L. piasus* is identical with Felder's *L. sagittigera*.

I have made a very careful study of Boisduval's descriptions in his *Lepidoptères de la Californie* and know from personal observation a little of the habits of *L. piasus* and *L. sagittigera*. The Oberthür figure would seem to show a startling misidentification, but I find it very difficult to reconcile myself to accept this alone as proof that *piasus* is the insect which Felder named *sagittigera* and which Boisduval later described and named *rhaea*.

Let us consider Boisduval's descriptions in the *Lepidoptères de la California*, 1869. In this edition he first gives the descriptions of the insects described in his paper of 1852, covering the material collected by M. Lorquin in Central California and particularly in the San Francisco Bay district in the years 1849 to 1852. He then describes additional material collected later by M. Lorquin during a series of trips which covered not only his first collecting grounds but also a part of what is now the southern part of the State of California.

Among the re-descriptions of the 1852 material we find:

38. *Lycaena piasus*, Boisd.

(Free translation from the Latin.)

Wings above dark blue-violet, pearl-white fringes, female with black margins; below ashy-white, with numerous ocellated black spots, separated by a white band.

(Free translation from the French.)

Slightly larger than our Argiolus, which it much resembles at first glance. Flitting in the spring and in summer in the woods.

39. *Lycaena pseudargiolus*, Boisd. and Leconte, Iconog. des Lep. de l'Amerique septentrionale, PC. 36.

(Free translation from the French.)

Does not differ from specimens from other parts of the United States. Flitting in numbers in April in the hedges.

In the second part of this paper, which covers the descriptions of the later material outlined above, we find:

33. *Lycaena rhaea*, Boisd.

(Free translation from the Latin.)

Wings above sea blue-violet with black margin and white fringe

intersected with black; below dark, ashy; forewings with black ocellated spots; secondaries with a broad, transverse, toothed, white band and with black, ocellated spots in the basal area? (*basilaribus.*)

(Free translation from the French.)

This beautiful species does not resemble any of our European species. It is a little larger than our *battus.* Above the wings are violet-blue with a rather wide dusky border and white fringe broken with black. Below it is dark cinder-colored; the forewings are marked with one basal spot, with a central lunule and with a sinuous line of well ocellated black spots; outside of the sinuous line one can see a sort of whitened band followed by little black crescents. On the secondaries the base is even more obscure and offers towards the base some black, ocellated spots, upon the cellule a whitened blot, next in order a row of black spots followed by a very clear white transverse band, toothed like a saw.

The female differs from the male in that one can perceive on the upper side of the secondaries the trace of two or three obsolete tawny lunules.

This charming *Lycaena* was taken by M. Lorquin in the far South in the vicinity of Los Angeles.

From the above descriptions I draw the following conclusions:

The under side of *L. rhaea* (or more properly speaking *L. sagittigera,* Felder, syn. *L. rhaea,* Boisd., since Felder described it before Boisduval's second paper was published) is strikingly different from any other species. Boisduval notices this at once in his description. If Lorquin had sent him any of these specimens prior to 1852 he would have described them fully in his first paper just as he did in his second paper. *Sagittigera* reaches its perfection in Southern California where Lorquin collected it subsequent to 1852.

Concerning *L. piasus* this is not strikingly different from certain other species and Boisduval did not exert himself to give a careful detailed description. We note its juxtaposition to *L. pseudargiolus* in the list of descriptions, and we know that it is somewhat different. It is one of our commonest spring butterflies and Lorquin could not have failed to send a large series of them prior to 1852. If Boisduval intended his description of *piasus* to cover *sagittigera,* where

then is his description of the species which we call *piasus?* The western form of *ladon,* Cramer (*pseudargiolus,* B. and LeC.) has strong enough characteristics to warrant the assumption that Boisduval would describe it.

In the description of *L. piasus* Boisduval states that it has white fringes. The fringe of *sagittigera* is very heavily cut with black, especially on the primaries, so much so in fact that the fringe might be described as white with black spots at the ends of the veins. None of the other California species of this genus except *sonorensis* approaches *sagittigera* in this characteristic.

Finally, Boisduval gives a brief tell-tale note of *piasus'* habits. He states that it flits about in spring and summer in the woods. This is peculiar characteristic of *L. ladon* including its western form *L. piasus.* They frequent the thickets and light woods and are not commonly seen out in the open spaces as are nearly all the other Lycaenae. I have a long series of perfect *sagittigera* and have never seen them in a similar locality. They were all taken in the open country flying low about the flowers, weeds and short brush.

If Oberthür's illustration, labelled *piasus,* really represents a true *sagittigera,* is it not probable that the labels have been mixed? I presume there will be considerable discussion of this matter before a definite conclusion is made. I have a number of spare specimens of *L. sagittigera* from the vicinity of Los Angeles and will be very glad to send samples to anyone desiring them for comparative study.

## Boisduval's Lycaena piasus and Lycaena rhaea (Lep.).

By Henry Skinner.

Mr. Haskin has raised a question that may be solved according to the weight of evidence. His contention is based on the probability of the labels being mixed. The figure 1950 given by Mr. Oberthür as *piasus,* represents what we always called *sagittigera* Felder. It is a very variable species and specimens without the checkered fringes are sometimes found. We have one specimen in the collection of the Academy that

agrees perfectly with the figure of *piasus*. *Rhaea* is the more ordinary form. The description of *piasus* Boisd., applies best to the species known later as *sagittigera* Feld. "Fringe whitish" applies to the specimen figured as the type by Oberthür, "with numerous black ocellated spots." This applies perfectly to *sagittigera* but not to the western form of *pseudargiolus* (*argiolus* Linn.) "separated by a whitish band." This also applies to *sagittigera* and not at all to *pseudargiolus*. The ocellated spots and the whitish band appear to me to be conclusive and can't possibly apply to *pseudargiolus*. "A little larger than our *argiolus*, which it strongly resembles at the first glance." This also applies to *sagittigera*, as the western *argiolus* is about the size of or smaller than the European species.

The final argument is the fact that Dr. Boisduval knew and fully recognized *Lycaena pseudargiolus*, as he says "This does not differ from specimens from other parts of the U. S. It flies commonly in thickets in April." It is likely that the species described by Boisduval and sent to him by Lorquin was only represented by meagre material and when he subsequently received *"rhaea"* he redescribed the same species. The descriptions of *piasus* and *rhaea* are very similar. Boisduval says the latter came from "around Los Angeles."

The weight of evidence seems to be on the side of the *piasus* description agreeing with the Oberthür figure. Mr. Oberthür will probably be able to shed additional light on the subject. The description of *piasus* can't possibly apply to the western *argiolus*.

### The Entomological Society of Ontario.

The Fifty-second Annual Meeting of the Society will be held in Ottawa on November 4th and 5th, 1915. Dr. L. O. Howard, Chief of the Bureau of Entomology, United States Department of Agriculture, has kindly consented to give the annual public lecture on Thursday, November 4th.

### A Liquid Preservative for Insects.

P. Schulze recommends for the preservation of galls, of coccids on plants and of larvae for dissection, especially in the tropics, the following mixture: 200 cc. glycerine, 200 cc. distilled water, 1 gram crystallized carbolic acid. (*Deut. ent. Zeitschr.*, 1915, p. 204.)

# A Few Notes on Queensland Insects.

By A. A. GIRAULT.

### 1. Hounds Devouring Grasshoppers (Orth.).

One day (June 28, 1912) on a sugar plantation near Cairns, N. Q., I saw one of a pack of four or five kangaroo dogs, a breed resembling the greyhound, on several occasions give eager chase to adults of *Locusta australis*, a large grasshopper; those which it succeeded in capturing were devoured with apparent relish.

### 2. Nyctalemon orontes (Lep.).

This day-flying moth is commonly seen flying singly like a butterfly; in November, 1912, at Nelson, North Queensland, the species was gathered in enormous numbers in dark and moist situations in the forest, covering the trees bordering streams in myriads and flying up in clouds as we advanced. Many were mating. The species, otherwise, is seen flying along singly throughout the year.

### 3. Activity of Orthoptera.

In North Queensland, throughout the year, the constant chirping of various kinds of crickets and long-horned grasshoppers is one of the daily sounds, though so monotonous that, like the ticking of a clock or watch, attention has to be directed to it before notice is taken. The constancy, however, is remarkable. I do not remember a time in the year when I have not been able to detect the chorus of sounds proceeding from that source.

### 4. Canaries Protected from Mosquitoes (Dip.).

I have been told that canaries kept as pets have to be covered with a net to protect them from mosquitoes and other biting flies; otherwise, they would go blind and lame from the constant bites of these insects. On one occasion I have happened upon an instance of this kind (at Seymour, Ingham District, North Queensland).

### 5. Pheidole megacephalus Fabricius Dying from Cold in North Queensland (Hym.).

Toward the last week of July, 1912, all over the Goondi, Darradgee and Mundoo cane plantations near Innisfail, I saw little heaps of dead ants, each heap containing several hundred specimens of the workers and soldiers. They were rather common and I was considerably puzzled to account for them until chancing to hear from a farmer that young sugar cane had been slightly damaged by recent frosts; the ants doubtless had suffered from the same cause, the more clearly indicated because the species appears to be an equatorial one or one of the uplands or of situations not exposed to cold spells in the tropical sense. Nests adjoining the heaps of dead contained living individuals acting as usual. Later, on August 8, at Nelson, North Queensland, I found the same species, dead in similar heaps; if along a road, these heaps all seemed to be in the wheel ruts; from their appearance, they were several weeks or more old. The name of the species was kindly given to me by Mr. Henry Tryon who, I think, had sent specimens for identification.

# ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1915.

### On Buying and Selling Insects.

There has lately been injected into the study of entomology a wave of commercialism that has done harm in a number of ways. The idea has been spread broadcast through the country that it is an easy matter to collect insects and sell them, particularly butterflies and moths. The statement is made that there are millionaire collectors who are just thirsting for material and that many institutions buy specimens of insects. The net result of this is keen disappointment to many persons and annoyance and bother to others. The aspirant for wealth by the sale of insects collects some *Pieris rapae, Colias philodice, Vanessa antiopa* and raises a few cecropias from the cocoon and then writes to some entomologist or institution asking how and where he can find a market for such things. Generally the aspirant for wealth wishes a list of those who buy, and those who buy have been collecting all their lives and of course will buy desiderata but can't be charmed by a luna moth or a cabbage butterfly. It is quite true that a good collector in a favored locality, can sell material properly caught, but it is equally true that one can't sell insects to good collectors when the insects are the same species that the collector can readily get himself. There are certain phases of the business advocated and advertised that are not only misleading but absolutely dishonest. Many persons are wasting their money for collecting apparatus, literature, postage, etc., who will never be able to derive a cent of profit.

The writer can't tell people where to sell common insects, and wishes some way of avoiding many letters from persons asking for information in regard to selling their wares. Personal visits and 'phone calls are also an annoyance. The NEWS will esteem it a favor if subscribers, willing to buy specimens, will send in their names and addresses so that commercial beginners may have an avenue by which they can acquire money and even wealth.—H. S.

# Notes and News.

## ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

### Habits of Xenoglossa brevicornis (Cresson) (Hym.).

The Rev. G. Birkmann, of Fedor, Texas, writes as follows: "I am sending you some bees which were gathered for a night's rest on the sprig of mesquite, also sent. Altogether there were just a dozen, all males. It is the first time I have found them so. They took hold of the leaves' petiole with their jaws, swung clear, and brushed themselves with their feet, then quieted down. All twelve were on the small twig during the whole night. I had taken them to my room. At 7 o'clock in the morning they were still resting, clinging to their twig on my desk, beside an open window. Date of capture, July 5." The specimens sent are all males of *Xenoglossa brevicornis*.—T. D. A. Cockerell, Boulder, Colo.

### An Observation on a Buprestid (Col.).

On the 17th of May, 1915, I received word from Mrs. H. Grandjean, of Oakland, California, that she had found a "beautiful green beetle," which had been working inside the door stile of the toilette-room, and that she had saved it for me. On the following Sunday I went to her house and was shown the door, which I examined carefully. It appears that the lady saw something moving on the door stile, which on closer observation proved to be a beetle trying to escape from inside the stile. She took a penknife and enlarged the hole sufficiently to allow the insect to escape. The beetle was a *Buprestis aurulenta* Fab. During the careful examination of the door I failed to find any evidence of any other holes, other than the one of exit, which was one and one-half inches deep and very nearly perpendicular. Otherwise the door was in perfect condition. From the bottom of the hole some wood dust was removed; it was of the color of healthy, dry, white pine, of which the stile was made.

In looking up the history of the house I found that the present owner, Mr. H. Grandjean, had purchased the house some twenty-one years ago, and it was at that time five years old, which made the total time twenty-six years since the house was built. The door in which the beetle was found had never been changed or replaced, and had been painted and varnished twice during the twenty-one years. The most interesting question about this beetle being in the door is, how long had it been since the egg, or the larva, gained entrance to the wood of that stile?

*Buprestis aurulenta* Fab. is one of the most common species of the genus in California, and is naturally confined on the Pacific Coast to the districts timbered with coniferous trees. Dr. Blaisdell tells me that it is plentiful in Oregon and Washington; in California he has col-

lected it in Siskiyou, Calaveras, Placer, Alpine, Marin and Sonoma Counties, at the higher altitudes and wherever coniferous trees were found. Its occurrence at lower levels, and in cities and towns, can be accounted for by its transportation in the timber that is taken there and which contains one or the other of the early stages of the insect. I have collected it in Placer and Eldorado Counties. Mr. L. Munier has also taken it in Plumas County. The occurrence of the above reported specimen under such conditions is something very unusual and offers an opportunity for speculation as to how and when the egg, or larva, gained access to that door. Was it previous to the building of the house, or did a stray beetle enter the house and oviposit in that door at a recent date?—J. C. Huguenin, San Francisco, Cal.

**Notes on Some Chalcidoid Hymenoptera from Java.**

The following notes are upon some parasites sent to me by Herr P. von der Goot, Pasoeroean, Java.

1. *Paranagrus optabilis* Perkins. A number of specimens of both sexes, which agree with specimens of *P. perforator* Perkins from North Queensland, except that the ovipositor is not exserted; they also agree with the original description of *optabilis* except that the abdomen is dusky above before tip in some female specimens; in other females, the abdomen was not marked with dusky. The antennal joints varied somewhat. One male specimen had the abdomen wholly dusky. The specimens were reared April 4, 1913, from the eggs of *Dicranotropis* (*Perkinsiella*) *vastatrix* Breddi and both this host and the locality are new for the species. The host was on sugar cane and the wide distribution of the parasite is thus accounted for.

2. *Arrhenophagus chionaspidis* Aurivillius. It was surprising to meet with this curious encyrtid from Java, though it is known to occur in Asia. A large number of specimens were reared from *Aulacaspis rosae* on rose, March 25, 1913. I have verified its redescription published by me in 1911, yet the antennae still need very careful scrutiny from fresh specimens.

3. *Ablerus pulchriceps* Zehntner. So far as I know, this is a valid species differing from six North Queensland species by bearing a distinct wing pattern. Thus, in addition to the two bands across the forewings (common only to extra-Australian forms), the second band sends off an arm to the wing apex just below (caudad of) the middle of the wing blade. I will point out elsewhere that *Azotus* Howard and *Ablerus* of the same author are identical. In *pulchriceps* also the proximal cross-band of the forewing sends out a longer arm toward the base of the wing; the marginal fringes of the forewings are rather longer than usual. The very short joint (joint 6, counting the ring joint) in the male antennae is black. Structurally, the species is not different from the Australian forms.—A. A. Girault, Washington, D. C.

**Habits of Spinoliella zebrata (Cresson) (Hym.).**

On July 25, in the vicinity of the Bluebird Mine, in the mountains of Boulder County, Colorado, I found a great number of bees swarming in the road. They were flying rapidly over the surface of the ground, and frequently half a dozen or more would engage in a fight, tumbling over each other in the dust, in a confused mass. On catching a few, I found that they were all males, and to my great astonishment, belonged to the species *Spinoliella zebrata*, which I had never seen alive before. It is a very conspicuous bee, hardly to be overlooked, and its local abundance in a region where it had never been observed during ten years was astonishing.—T. D. A. COCKERELL, Boulder, Colo.

**Some Muscoid Synonyms.**

The following synonymy is offered as a matter of record:—

*Clytiomyia punctata* Coquillett, 1895, Jn. N. Y. Ent. Soc. III. 52-53; *Oestrophasia punctata* Coquillett, 1897, Rev. Tach. 71, equals ORMIA PUNCTATA R. D., 1830, Myod. 428.

*Oestrophasia setosa* Coquillett, 1902, Proc. U. S. N. M. XXV, 110, equals OESTROPHASIA CLAUSA B. B., 1889, Musc. Schiz. I. 145-146.

*Senotainia fasciata* Coquillett, 1897, Rev. Tach. 81, equals EUMACRONYCHIA ELITA Townsend, 1892, Trans. Am. Ent. Soc. XIX. 100.

*Paraphyto* Coquillett, 1895, Jn. N. Y. Ent. Soc. III, 105, apparently equals WOHLFARTIA Brauer & Bergenstamm, 1889, Musc. Schiz. I. 123. The holotype of *P. chittendeni* appears to be strictly congeneric with the European *W. meigenii* Schiner.

*Polychaetoneura elvii* Walton, 1914, Proc. Ent. Soc. Wash. XVI. 90-91, equals *Thryptocera americana* Townsend, 1892, Can. Ent. XXIV. 69-70, equals GYMNOPHTHALMA Lioy, 1864.

*Neaera longicornis* Coquillett, 1902, Proc. U. S. N. M. XXV. 106-107, equals *Clausicella usitata* Coquillett, 1897, Rev. Tach. 56, equals female SCHIZOTACHINA CONVECTA Walker, 1856, Dipt. Saund. 276.

EUHALLIDAYA *severinii* Walton, 1914, Proc. Ent. Soc. Wash. XVI. 130-132, equals BIOMYIA GENALIS Coquillett, 1897, Rev. Tach. 82-83. The two specimens referred to under the name *severinii* are both males. The female differs externally only in having the front, and especially the face, broader, outside of the hypopygium.

*Tachinopsis* Coquillett, 1897, Rev. Tach. 120, equals PLAGIPROSPHERYSA Townsend, 1892.

*Petia* Coquillett, 1910, Proc. Ent. Soc. Wash. XII. 126-127, equals CATHAROSIA Rondani, 1868. The two genotypes are so nearly identical in both structure and color that it will be difficult to define their distinctness.

It may also be mentioned that *Thryptocera dunningii* Coquillett, 1895, Jn. N. Y. Ent. Soc. III. 54, referred to *Hypostena* in 1897, Rev. Tach. 60, equals SPATHIDEXIA Townsend, 1912, the genotype of which has been determined by Coquillett as *Thelairodes cinereicollis* Wp.—CHARLES H. T. TOWNSEND, Bureau of Entomology, U. S. Dept. Agric., Washington, D. C.

**Changes of Address.**

Correspondents are respectfully requested to note that my address has been changed from Bureau of Science, Manila, to College of Agriculture, Los Baños, Laguna, Philippine Islands.—CHARLES S. BANKS, Associate Professor of Entomology, University of the Philippines.

Prof. RAYMOND C. OSBURN has severed his connections with Barnard College, Columbia University and The New York Aquarium to become professor of biology in the new Connecticut College for Women at New London, Conn., and may be addressed at that place hereafter.

**University of the Philippines College of Agriculture, Los Baños, Department of Entomology and Zoology.**

The undersigned is pleased to inform his colleagues and those Institutions which may be interested and with which cordial relations have existed in the past, that the entire Entomological Collection of the Bureau of Science at Manila has been transferred to the University of the Philippines and is now located in ample quarters at the College of Agriculture, Los Baños, Laguna, P. I., 65 kilometers from Manila by railroad.

This collection, which contains most of the types of Philippine insects, in all orders, described by European and American specialists during the past 12 or 13 years, and containing, at present, more than 300,000 pinned specimens, together with alcoholic and biological material, will be materially increased in value by the collecting of Faculty and Students in the exceedingly rich faunal regions of Los Baños, Mt. Maquiling and Mt. Banahao.

As in the past exchanges will gladly be accepted from individuals and institutions who can furnish material related to forms found in the Philippine Islands.

Identifications of insects of this region will be made, as other work permits, for Departments of the Philippine government and for all individuals who are willing to present such identified material to the college.

Entomologists visiting the Philippines will be cordially welcomed to the laboratories and every facility for their comfort will be placed at their disposal.—CHARLES S. BANKS, Associate Professor of Entomology, Chief of the Department.

**A Schizoneuran Migrating from Elm to the Apple (Homop.).**

Since the following observations, made by the writer during the latter part of June, 1914, furnish further evidence of the migration of elm-cluster, or elm-rosette, louse to the apple and also supply the observations, for Colorado, the lack of which led Gillette and Bragg* to state that they could not accept the conclusions of Dr. Patch that *Schizoneura lanigera* upon the apple has anything to do with the production of either the elm-curl or the elm-cluster as described by Riley, they would appear to be of especial interest at this time.

*Journal of Economic Entomology, Feb., 1915.

June 18, 1914, several Schizoneuran migrants were observed on the under side of the leaves of water shoots about apple trees in the yard of the writer. A number of these, which were collected and examined, turned out to be migrants from the elm leaf-clusters, which were very numerous on young white elms just across the street to the east. These lice were shrunken and appeared to have deposited all of their young, but were still alive and active. An examination of the shoots revealed a number of what appeared to be Schizoneuran larvae in the axils of several of the leaves. These were in the first instar and just beginning to show the characteristic woolly secretion of the woolly apple louse. On the following Sunday, the 21st, an alate Schizoneuran was taken in the act of depositing her young on the under side of an apple leaf of the same trees mentioned above. There were three young near her on the leaf and several others were found in the axil of the leaf. This louse was also of the rosette type.

Later, lice from a leaf cluster from the elm trees mentioned were placed in a lantern globe cage in which there was an apple twig. These lice appeared perfectly content on the apple leaves and were observed to deposit their young almost as soon as placed in the cage. By July 5th the twig in this cage was nearly covered with young lice, which were so covered with the woolly secretion as to make the twig nearly white over its entire length of about six inches. At this point other work prevented the completion of the experiment. From the results of the work done the writer feels sure that *Schizoneura lanigera* and the elm-curl louse are the same, the latter being the spring form of the former.—Asa C. Maxson, Longmont, Colorado.

# Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

Unless mentioned in the title, the number of new species or forms are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London.

For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**3**—The American Naturalist. **4**—The Canadian Entomologist. **5**—Psyche. **8**—Entomologist's Monthly Magazine, London. **11**—Annals and Magazine of Natural History, London. **21**—The Entomologist's Record, London. **28**—Archives d'Anatomie Micro-

scopique, Paris. **46**—Tijdschrift voor Entomologie. **50**—Proceedings, U. S. National Museum. **51**—Novitates Zoologicae, Tring, England. **68**—Science, New York. **81**—Biologisches Centralblatt, Erlangen. **84**—Entomologische Rundschau. **87**—Bulletin, Societe Entomologique de France, Paris. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **102**—Proceedings, The Entomological Society of Washington. **123**—Bulletin, The Wisconsin Natural History Society, Milwaukee. **128**—Proceedings, Linnean Society of New South Wales, Sidney. **131**—Proceedings of the South London Entomological and Natural History Society. **143**—Ohio Naturalist. **153**—Bulletin, The American Museum of Natural History, New York. **166**—Internationale Entomologische Zeitschrift, Guben. **173**—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. **175**—Aus der Natur, Berlin. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **184**—Journal of Experimental Zoology, Philadelphia. **185**—Journal, Quekett Microscopical Club, London. **186**—Journal of Economic Biology, London. **189**—Journal of Entomology and Zoology, Claremont, Cal. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **208**—Boletin, Real Sociedad Espanola de Historia Natural, Madrid. **211**—Popular Science Monthly, Lancaster, Pa. **216**—Entomologische Zeitschrift, Frankfurt A. Main. **240**—Maine Agricultural Experiment Station, Orono. **242**—Transactions, The Royal Society of Canada, (3d Series), Ottawa. **272**—Memorias, Real Academia de Ciencias y Artes de Barcelona. **275**—Philippine Journal of Science, Manila. **304**—Annals of the Carnegie Museum. **321**—Annals of the New York Academy of Sciences. **332**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **344**—U. S. Department of Agriculture, Washington, D. C. **355**—Smithsonian Institution Report, Washington, D. C. **359**—Connecticut Agricultural Experiment Station, New Haven. **369**—Entomologische Mitteilungen, Berlin-Dahlem. **394**—Parasitology, Cambridge, England. **404**—Report of the Quebec Society for the Protection of Plants. **410**—Journal of the Washington Academy of Sciences. **411**—Bulletin, The Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **422**—Coleopterologische Rundschau, Wien. **447**—Journal of Agricultural Research, Washington. **448**—Verhandlungen der Physikalisch-Medicinischen Gesellschaft zu Wurzburg. **475**—Bulletin de la Societe Vaudoise des Sciences Naturelles. **480**—The Annals of Applied Biology. **511**—American Forestry. **512**—Korrespondenzblatt des Naturforscher-Vereins zu Riga. **513**—South African Journal of Sciences, Cape Town. **514**—Contributions a la Faune des Indes Neerlandaises, Buitenzorg. **515**—Proceedings, American Philosophical Society, Philadelphia.

**GENERAL SUBJECT. Banks, N.** (See under Neuroptera). **Blair, K. G.**—Luminous insects, **131,** 1914-15, 31-45. **Blume, E.**—Ein neuer lichtfang-apparat, **216,** xxix, 15-16. **Brunner von Wattenwyl, C.**—Noticia necrologica por I. Bolivar, **208,** xv, 161-66. **Ealand, C. A.**—Insects and man: an account of the more important harmful and beneficial insects . . . 341 pp., 16 pls., 100 figs. [The Century Co.] **Hollandie, A. C.**—The "cerodecytes" or "oenocytes" of insects considered from the biochemical viewpoint, **28,** xvi, 1-66. **Hopf, W.**—Die verwendung des karten-systems fur den entomologie, **166,** ix, 26-8. **Keuchenius, P. E.**—On remarkable gland-hairs with insects, **514,** 49-52. **McAtee, W. L.**—Bird enemies of forest insects, **511,** xxi, 681-91. **MacGillivray, A. D.**—The Entomological Society of America. (Resume of Philadelphia meeting), **68,** xli, 842-3. **Marcovitch, S.**—The biology of the juniper berry insects with descriptions of n. sps. [Hym.., 1 new; Dipt., 1 new], **180,** viii, 163-189. **Sears, P. B.**—Corrections to the list of insect galls of Cedar Point, **143,** xv, 518. **Shelford, V. E.**—Suggestions as to the original habitat and distribution of various native insect pests, **179,** viii, 171-4. **Sumner, F. B.**—Some reasons for saving the genus, **68,** xli, 899-902. **Thompson, S. M.**—An illustrated catalogue of American insect galls. Edited by E. P. Felt, 166 pp. (Pub. by Rhode Id. Hospital Trust Co.). **Weiss, H. B.**—Notes on the occurrence of some economic insects not heretofore recorded from N. J., **5,** xxii, 105-6.

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phaga, **394**, viii, 101-27. **Marshall, W. S.**—The development of the hair upon the wings of Platyphylax designatus, **180**, viii, 53-62. **Moznette, G. F.**—Notes on the brown lace-wing (Hemerobius pacificus), **179**, viii, 350-4. **Tillyard, R. J.**—On some problems concerning the development of the wing-venation of Odonata, **128**, xxxix, 163-216.

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Confusion of Rhopalosiphum hippohaes and Myzus braggii, **179,** viii, 375-9. **Muir, F.**—A contribution towards the taxonomy of the Delphacidae, **4,** 1915, 208-12 (cont.). **Osborn, H.**—Leafhoppers of Maine [13 n. sps.], **240,** Bul. 238, 81-160. **Osborn & Drake.**—Additions and notes on the Hemiptera-Heteroptera of Ohio; Records of Guatemalan Hemiptera-Heteroptera, with descriptions of new species, **143,** xv, 501-8; 529-41. **Parshley, H. M.**—Systematic papers on New England Hemiptera, I, Synopsis of the families, **5,** xxii, 88-94. **Van Duzee, E. P.**—New genera and species of American Hemiptera [3 n. g.; 10 n. sps.], **189,** vii, 109-121.

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**Wheeler, G.**—The genus Melitaea, **131,** 1914-15, 1-16. **Wagner, H.**—Lepidopterorum catalogus. Pars 21: Sphingidae: Philampelinae, 221-304. **Ely, C. R.**—New sps. of the genus Gracilaria and notes on two sps. already described. [9 new], **420,** iii, 51-62. **Rothschild & Jordan.**—Some new Sphingidae in the collection of the British Museum; New exotic Zygaenidae in the Tring Museum, **51,** xxii, 291-4; 295-301. **Braun, A. F.**—New genera and sps. of Tineina [4 n. gen.; 6 n. sps.], **4,** 1915, 188-97. **Busck, A.**—Descriptions of new No. Amer. microlepidoptera [1 n. gen.: 31 n. sps.], **102,** xvii, 79-94. **Draudt, N.**—Sphecosoma-cosmosoma, **173,** 1 Abt., 41-72. **Dyar, H. G.**—Two new L. from the Antilles; New American L. chiefly from Mexico [1 n. sp.]; Pyralidae of Bermuda, **420,** iii, 62; 79-85; 86-89.

**DIPTERA. Aldrich, J. M.**—The economic relations of the Sarcophagidae, **179,** viii, 242-46. **Bishopp, F. C.**—Flies which cause

myiasis in man and animals—some aspects of the problem, **179,** viii, 317-29. **Felt, E. P.**—A new pest, the Chrysanthemum midge (Rhopalomyia hypogaea), **179,** viii, 267. **Keuchenius, P. E.**—Ueber den bau der internen geschlechtsorgane einiger weiblichen dipteren, **514,** i, 33-48. **Kramer, S. D.**—The effect of temperature on the life cycle of Musca domestica and Culex pipiens, **68,** xli, 874-77. **Mally, C. W.**—Note on the use of poisoned bait for controlling the house fly (Musca domestica), **513,** xi, 321-28. **Marcovitch, S.**—(See under General). **Muttkowski, R. A.**—New insect life histories. I (Psychoda cinerea & Diamesa mendotae n. sp.), **123,** xiii, 109-22. **Richardson, C. H.**—A contribution to the life history of the corn feeding syrphus fly (Mesogramma polita), **179,** viii, 338-42. **Shannon, R. C.**—Mosquitoes attacking a frog, **102,** xvii, 99. **Winn & Beaulieu.**—A preliminary list of the insects of the Province of Quebec. Part II, Diptera, **404,** vii, 107-159. **Minchin, E. A.**—Some details in the anatomy of the rat flea, Ceratophyllus fasciatus, **185,** xii, 441-46.

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**Aldrich, J. M.**—New American sps. of Asteia and Sigalsoesa [5 n. sps.] **5,** xxii, 94-8. **Brues, C. T.**—A new wingless fly from Jamaica, **5,** xxii, 102-104. **Felt, E. P.**—New No. American gall midges [1 n. gen.; 6 n. sps.], **4,** 1915, 226-32. **Knab, F.**—A new Simulium from Texas, **420,** iii, 77-8. **Malloch, J. R.**—Two new No. American Diptera, **411,** x, 64-6. **Smith, H. E.**—New sps. of Tachinidae from New England. [1 n. gen.; 4 n. sps.], **5,** xxii, 98-102. **Townsend, C. H. T.**—Correction of the misuse of the generic name Musca, with descriptions of two n. gen., **410,** v, 433-36; New Andean Spallanzaniine flies; New Peruvian Hystriciine flies, **420,** iii, 63-69; 69-76. **Van Duzee, M. C.**—Table of N. A. sps. of the dipterous genus Thrypticus, with descriptions of four n. sps., **5,** xxii, 84-8. **Walton, W. R.**—On the genus Exoristoides, **102,** xvii, 96-9.

**COLEOPTERA. Britton, W. E.**—Some common lady beetles of Connecticut, **359,** Bul. 181. **Chapman, R. N.**—Observations on the life history of Agrilus bilineatus, **447,** iii, 283-94. **Craighead, F. C.**—Larvae of the Prioninae, **344,** Off. Secty., Rept. 107. **Eichelbaum, F.**—Die larve und puppe von Cis bidentatus und die larve von Psammodes spec? nebst bemerkungen zur anatomie der larve von Caryoborus nucleorum, **369,** iv, 131-7. **Garb, G.**—The eversible glands of a chrysomelid larva, Melasoma lapponica, **189,** vii, 88-97. **Jaques, H. E.**—The fish-feeding C. of Cedar Point, **143,** xv, 525-28. **Lovell, J. H.**—The origin of anthophily among the C., **5,** xxii, 67-84. **McIndoo, N. E.**—The olfactory sense of C., **198,** xxviii, 407-61. **Nowell, W.**—Two scoliid parasites on scarabaeid larvae in Barbados, **480,** ii, 46-57. **Thilo, O.**—Das schnellen der springkaefer (Elateriden), **512,** lvii, 120-6. **Wadsworth, J. T.**—On the life history of Aleochara bilineata, a staphylinid parasite of Chorlophila brassicae, **186,** x, 1-27.

**Wallis, J. B.**—Popular and economic entomology. Some Manitoban water beetles, **4**, 1915, 169-74.

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**Bernhauer, M.**—Zur Staphyliniden fauna von Sud-Amerika (12th Beitrage), **216**, xxix, 13-14. **Bryant, C. E.**—New species of Pselaphidae, sub-fam. Clavigerinae, **8**, 1915, 211-15. **Csiki E.**—Coleopterorum catalogus Pars 63; Mordellidae, 84 pp. **Fisher, W. S.**—One new genus and two n. sps. of Cerambycidae, **402**, xvii, 77-9. **Gardner, R. E.**—Elateridae from the Claremont-Laguna region, **189**, vii, 139-40. **Hopkins, A. D.**—A new genus of scolytoid beetles [Conophthorus; 14 new species], **410**, v. 429-33. **James, R. P.**—Chrysomelidae in the Claremont-Laguna region, **189**, vii, 136-7. **Obenberger, P. J.**—Einige beitrage zur kenntnis der Anthaxien, **422**, 1915, 73-83. **Pic, M.**—Trois nouveaux Chauliognathus du Bresil, **87**, 1915, 133-4. **Pierce, W. D.**—Some sugar-cane root-boring weevils of the West Indies, **447**, iv, 255-64. **Schenkling, S.**—Neue beitrage zur kenntnis der Cleriden I, **369**, iv, 107-14. Coleopterorum catalogus, Pars 64: Derodontidae, Lymexylonidae, Micromalthidae, 19 pp.

**HYMENOPTERA. Britton, W. E.**—A destructive pine sawfly introduced from Europe (Diprion simile), **179**, viii, 379-82. **Brun, R.**—Das orientierungsproblem in allgemeinen und auf grund experimenteller forschungen bei den Ameisen, **81**, xxxv, **190-207. Davidson, A.**—Habits of a Cleptis (wasp), **332**, xiv, 51. **Dickel, F.**—Die geschlechtsbildungsweise bei der honigbiene wie deren grundsatzliche . . . **92**, xi, 149-54 (cont.). **Johnston, F. A.**—Asparagus-beetle egg parasite, **447**, iv, 303-14. **McColloch, J. W.**—Further data on the life economy of the chinch bug egg parasite, **179**, viii, 248-61. **Mader, L.**—Ueber das ausnehmen von wespen nestern, **422**, 1915, 84-8. **Mehling, E.**—Ueber die gynandromorphen bienen des eugsterchen stockes, **448**, xliii, 171-236. **Parker, J. B.**—Notes on the nesting habits of some solitary wasps, **102**, xvii, 70-77. **Richardson, C. H.**—An observation on the breeding habits of Stigmus conestogorum, **5**, xxii, 104-5. **Schoennichen, Dr.**—Die "Wachszange" der honigbiene, **175**, xi, 339-42.

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**Cockerell, T. D. A.**—Descriptions and record of bees, LXVII: [6 new]; LXVIII, **11**, xv, 529-37; xvi, 1-9. **Crawford, J. C.**—A n. sp. of the genus Secodella, **102**, xvii, 100. A new sp. of the genus Chalcis, **420**, iii, 89-90. **Crosby & Matheson.**—An insect enemy of the four-lined leaf-bug (Poecilocapsus lineatus) [Cirrospilus ovisugosus], **4**, 1915, 181-3. **Forel, A.**—Formicides d'Afrique et d'Amerique nouveaux ou peu connus, **475**, I, 211-88. **Girault, A. A.**—A n. sp. of Pseudomphale from Chile, **4**, 1915, 234-5. **Marcovitch, S.**—(See under General.) **Sladen, F. W. L.**—Characters separating the species of the bee genus Coelioxys occurring in Ontario, **4**, 1915, 205-8. **Wheeler, W. M.**—Some additions to the North Am. antfauna [many new names], **153**, xxxiv, 389-421.

INSECTS AND MAN: An Account of the More Important Harmful and Beneficial Insects, Their Habits and Life-Histories, Being an Introduction to Economic Entomology for Students and General Readers. By C. A. EALORD, M. A. Late Principal of the East Anglian College of Agriculture. The Century Co., New York. Price $3.50 net, postage 20 cents.—The work contains 322 pages, 16 plates, 100 drawings and a bibliography. There is a brief introductory chapter followed by seven others with the following titles: Insects and Plants, Insects and Human Disease, Insect Enemies of Live Stock, Beneficial Insects, Household Insects, Some Human Parasites, Insect Control. Under insects and plants, some of the well known and more important pests are briefly discussed. The matter is given in somewhat of a narrative form and is evidently intended to create an interest in the subject. This will prove a useful book for those who wish to acquire a general knowledge of the subjects treated. Our knowledge of economic entomology in relation to man and other animals has increased so rapidly that it is impossible to treat the subject in detail in one volume. H. S. (*Advertisement*).

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THE BUTTERFLY GUIDE: A Pocket Manual for the Ready Identification of the Commoner Species Found in the United States and Canada. By W. J. HOLLAND, L.L.D. Doubleday, Page and Company, Garden City, New York. Price, cloth, $1.00. Leather, $1.25.—This book measures about 6 by 3½ inches and can be readily slipped into the pocket and carried into the field. It contains 295 figures in color illustrating 255 species. The three-color half-tone reproduces butterflies with an accuracy that is truly wonderful and has greatly reduced the cost of illustrated works on butterflies and moths. Many persons were doubtless deterred from taking up the study on account of the expense of getting the necessary literature. In Europe they were more fortunate as there were a number of works at a reasonable price. Now that Dr. Holland has produced his "Guide," at the small cost of one dollar, illustrating approximately one-half the species found in the United States and northward, many more persons will be able to take up the fascinating study of these beautiful insects, particularly young people. There is an introduction in which anatomy and life history are discussed and also collecting and mounting.

The author is to be congratulated on producing an exceedingly valuable book. Some errors have crept into the work which should be corrected in another edition, such as the incorrect references to *Argynnis aphrodite* and *cybele* on pages 76 and 77 and the name of the skipper on page 215.—H. S. (*Advertisement*).

# Doings of Societies.

## American Entomological Society.

Meeting of June 14th, 1915, in the Academy of Natural Sciences of Philadelphia. Nine persons present. Dr. Philip P. Calvert, President in the chair.

**General**—Mr. Hornig related his experience with an insecticide spraying compound called "No-Bug-Atal" which he said kills all kind of insects and ticks instantly on contact. It appears to be harmless to most animals, but to cats and rodents it is said to be fatal. In all cases witnessed the spray proved successful. He also said the collecting at Alloway, New Jersey, this year was relatively very poor when compared with that of last year. Dr. Castle made some remarks on his winter trip to Florida. The winter was unusually cold and dry, so not much collecting was done until the rainy season started in February. He was then able to make some interesting captures. The extensive forest fires also destroyed some of his favorite collecting places. His ground traps did not seem to give results and upon a nocturnal investigation he discovered that toads were always on guard at the edges of the traps.

**Diptera**—Mr. Greene recorded the capture of *Euparyphus tetraspelus* Lw. at Roxborough, Penna. June 13th, 1915. This is the first record for the State.

**Hymenoptera**—Lewis H. Weld of Evanston, Illinois, presented the types and galls of *Callirhytis furnessae* Weld and *Synergus furnessana* Weld.

Mr. Greene spoke of observing the males of *Megarhyssa greenei* with their abdomens inserted in the holes made by *Tremex*. He took them to be females ovipositing until upon investigation they proved to be males.

**Odonata.**—Dr. Calvert spoke on the relation of the caudal gills of Odonate larvae to the development of intestinal tracheae, with special reference to the genus *Calopteryx*. He also mentioned diatoms on the legs of larvae of *Thaumatoneura* and quoted Prof. Mann, an authority on diatoms, who considered that the possible transportation of diatoms by aquatic insects would explain some puzzling cases of distribution. Dr. Calvert also exhibited a method of mounting Odonate larval exuviae on mica slides for ready examination.

E. T. Cresson, Jr., *Secy. pro tem.*

## Feldman Collecting Social.

Meeting of May 19th, 1915, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia. Twelve members and one visitor present, President Wenzel in the chair.

Mr. Herman Hornig was elected a member of the Social.

**Coleoptera**—Geo. M. Greene exhibited a pair of remarkable Lu-

canidae from Victoria, Chile—*Chasiognathus granti* Steph. Mr. Daecke said he had found feeding a living specimen of *Trogoderma tarsale* Melsh. in his collection at Harrisburg, an unusual place for this species of Dermestidæ. Mr. H. W. Wenzel said a short time ago when Mr. Schaeffer was here he mentioned four species of Coleoptera introduced here from Europe which now have a foothold: two species of *Philonthus,* a large *Aphodius* and *Sphaeridium 2-pustellatum* Fabr. Mr. H. A. Wenzel while at Lansdowne, Delaware Co., Pa., May 1, 1915, captured two of these in large numbers: *Philonthus varians* Payk. and the *Sphaeridium.*

**Lepidoptera**—Mr. Daecke exhibited *Pyrgus centaureae* Ramb. and *Gonodontia obfirmaria* Hbn., both from Rockville, Pa., April 25, 1915, the latter being uncommon in this State.

**Diptera**–Mr. Laurent exhibited series of *Pollenia rudis* Fabr. and *Phormia regina* Meig. and stated that he had captured specimens of both species every month in the year.

Adjourned to the annex. GEO. M. GREENE, *Secretary.*

## The Pacific Coast Meetings.

The Entomological Society of America met on Monday afternoon, August 2, on Tuesday, August 3, and on Thursday, August 5, in Room 113, Agriculture Hall, University of California, at Berkeley, and on Wednesday afternoon, August 4, in Room 430, Department of Zoology, Stanford University, at Palo Alto. The American Association of Economic Entomologists met on Monday and Tuesday, August 9 and 10, in Room 216, Agriculture Hall, University of California. Some entomological papers were also presented at the meetings of Section F, Zoology, of the American Association for the Advancement of Science and the American Genetic Association, August 2-3, 5-6, at Berkeley, August 4, at Palo Alto. We are indebted to Dr. Edwin C. Van Dyke, of the Entomological Laboratory of the University of California, who acted as Secretary of the Entomological Society, for information on the meetings. There was an average attendance of about thirty at most meetings of the Entomological Society; the Association of Economic Entomologists had slightly more at some sessions. Eleven papers were presented to the Entomological Society, eighteen to the Economic Entomologists, including those read by title only, which, with four others of entomological content before other bodies, make a total of 33, as compared with totals of 74, 85 and 96 for the winter convocation meetings of 1912, 1913 and 1914 respectively. A joint dinner with the Biological Society of the Pacific was held on August 4, at 7 P. M. in the Hotel Sutter, San Francisco, and was attended by many entomologists. Excursions for zoologists to Mt. Tamalpais and Muir Woods on August 7, in charge of Dr. C. Hart Merriam; to Rancho La Brea on August 13, conducted by F. S. Daggett and John C. Merriam; and to the Scripps Institution for Biological Research, were arranged.

While the papers will be published by the various societies concerned, our readers will, perhaps, like to see the titles as read, as far as we have received them, grouped according to subject, as in the NEWS for last February (page 90). Those unmarked are from the program of the Economic Entomologists, those starred (*) from that of the Entomological Society; others are designated by abbreviations of the respective Societies' names.

GENERAL SUBJECTS.—COCKERELL, T. D. A., University of Colorado, Boulder, Fossil Insects and Evolution. (Sect. F, A. A. A. S.).—MELANDER, A. L., State College of Washington, Pullman, The Pronunciation of Insect Names*.—VAN DUZEE, E. P., University of California, Priority in Family Names and Related Matters*.—VAN DYKE, E. C., ibid., The Distribution of Insects in Western North America*.—WOODWORTH, C. W., ibid., Quantitative Entomology.*

PHYSIOLOGY.—CLAUSEN, C. P., Riverside, Cal., A comparative study of a series of Aphid-feeding Coccinellidae.—DEWITZ, J., Metz, Germany, Ueber die Gifte der Pflanzenläus.—See also under "Insects Injurious to Plants," "Hemiptera" and "Hymenoptera."

GENETICS.—MCCRACKEN, MARY I., Stanford University, Notes on Silk-worm Heredity, with special reference to the Moricaud Race (Amer. Gen. Assn.).

INSECTS INJURIOUS TO PLANTS.—BALL, E. D., Logan, Utah, Field Notes on Grasshopper Outbreaks, The Distribution of the Beet Leaf-Hopper.—BURGESS, A. F., Melrose Highlands, Mass., Some Phases of Gipsy Moth Work in New England.—CHILDS, L., Corvallis, Ore., Notes on Control of the Apple Leaf Roller in Oregon.—GRAY, G. P., Berkeley, Cal., Sulphur and Derivatives used as Insecticides, Rainfall and Effect of burning of trash in Sugar Cane Fields of West Indies on Injurious Insects.—MELANDER, A. L., Pullman, Wash., Varying Susceptibility of San José Scale to Sprays.—PEMBERTON, Effect of Cold Storage on the Mediterranean Fruit Fly.—WELDON, G. P., Sacramento, Cal., The Wooly Aphis as a Pear Pest.—WILSON, H. F., Corvallis, Ore., The Toxic Values of the Arsenates of Lead.

BENEFICIAL INSECTS.—SWEZEY, O. H., Honolulu, H. I., Some Results of the Introduction of Beneficial Insects in Hawaii.—See also under "Physiology."

INSECTS INJURIOUS TO MAN AND ANIMALS.—BISHOPP, F. C., Bureau of Entomology, U. S. Dept. Agric., The Distribution and Abundance of the Ox Warbles (*Hypoderma lineata* and *H. bovis*) in the United States*, A Preliminary Note on the Wool Maggots of Sheep in the United States.—ILLINGWORTH, J. F., Honolulu, H. I., Notes on the Habits and Control of Hen Fleas (*Xestopsylla gallinacea*).—SCOTT, J. W., University of Wyoming, The Insect Transmission of Swamp Fever. (Sect. F., A. A. A. S.)—ZETEK, J., Panama Canal Zone, The Reduction of Malaria by Reducing the Number of Malarial Mosquitoes within Houses.*—See also under "Diptera."

DIPTERA.—Melander, A. L., State College of Washington, Pullman, Review of the American Species of Scatopsidae.—Herms, W. B., University of California, The Anopheline Mosquitoes of California, Distribution and Ecological Consideration.*—See also under "Insects Injurious to Man and Animals."

HEMIPTERA.—Ball, E. D., Agricultural College of Utah, Logan, Some Special Adaptations to Arid Conditions Exhibited by Cercopidae and Membracidae.*—Wilson, H. F., Oregon Agricultural College, Corvallis, The Tribe Pterocomini, Family Aphididae.*—See also under "Physiology," "Insects Injurious to Plants" and "Parasites of Insects."

HYMENOPTERA.—McCracken, Mary I., Stanford University, Notes on California Cynipidae with Particular Reference to the Species *Diplolepis ambrosa* Full.*—Wheeler, W. M., Harvard University, On the Presence and Absence of Cocoons among Ants, The Nest-Spinning Habits of the Larvae and the Significance of the Black Cocoons of Certain Australian Species.*

PARASITES OF INSECTS.—McCulloch, Irene, University of California, Flagellates of Hemiptera (Sect. F., A. A. A. S.).

## Newark Entomological Society.

Meetings were held in the Newark Public Library on January 10, February 14, March 14 and April 11, 1915. President Buchholz presided at each meeting, the average attendance being ten members. Papers read—Relation of Insects to Plants as Destroyers, by Herman H. Brehme; Nursery Insects of New Jersey, by H. B. Weiss; Fleas as Carriers of the Plague, by H. B. Weiss. Mr. Weiss also exhibited three boxes of insects from all orders mounted on Mead's patented pins.

**Lepidoptera**—During a discussion of the food plants of *Catocala tristis* Edw., Mr. Keller mentioned breeding *Catocala epione* Dru., on hickory. Mr. Herman Brehme added a touch of spring to the meeting of February 14th by exhibiting live specimens of *Eumaeus atala*, which had emerged from pupae received from Miami, Florida. He also showed a series of *Feralia februalis* collected February 1 at Eldridge, California. At the meeting of March 14, Mr. Mayfield showed some interesting photographs of *Catocala* eggs. On April 11, Mr. Rummel exhibited blackberry stems injured by *Papaipema cataphracta* and also cocoons of *Telea polyphemus* Cram., which contained live pupae after having comparatively large holes burned in them by fire. Mr. Rummell also reported the following captures on March 26 at Upper Montclair, N. J., by beating bushes:—*Xylina bethunei* G. & R. (7 spec.), *Scopelosoma moffatiana* Grt. (7 specimens), *S. pettiti* Grt. (2 spec.), *S. sidus* Gn. (1 spec.), on March 31, *Copipanolis cubilis* Grt.

(8 spec.), *Scopelosoma ceromatica* Grt. (1 spec.), *Jodia rufago* Hbn. (3 spec.), and one specimen of *Feralia jocosa* Gn., on trunk of hemlock tree.

**Homoptera**—Mr. Weiss mentioned the fact that Brood VI of the Periodical Cicada was due in New Jersey in 1915 and that locality records of its appearance would be desirable.

**Coleoptera**–At the meeting of February 14, Mr. Weiss read a translation of a German article dealing with the Colorado Potato Beetle in Germany, which illustrated the thorough way the German authorities took in dealing with an unwelcome importation from the United States. Among other things, it stated that military aid was secured to hunt for the beetles and engage in the work of extermination.—HARRY B. WEISS, *Recording Secretary.*

## OBITUARY.

### JOSEPH TARRIGAN MONELL.

(Portrait, Plate XIV)

On Sunday morning, May 9, 1915, after a protracted illness, Joseph Tarrigan Monell, prominent aphidologist, passed away at his home in St. Louis, Missouri, in his 56th year. He was born in St. Louis, September 15, 1859, son of Archer and Hester (Tarrigan) Monell, both of Philadelphia and of English extraction. In 1863 he was left an orphan and became the ward of Henry Shaw, founder of the Missouri Botanical Gardens, who educated him, first in the Shaw School near the gardens and later in Smith's Academy and Washington University, at which latter institution he received the degree of Mining Engineer in 1881. During his university career he was for two years a volunteer student under Dr. C. V. Riley, then State Entomologist of Missouri, and one year a student under Dr. George Engelman, the eminent botanist.

He by profession was a Civil and Mining Engineer, his first position being with the B. & C. R. R. in Illinois, which he soon left to become chemist and assayer of a silver and refining company. Later (1882-86) he was chemist in charge of the smelters of several lead companies in Missouri. From 1886 to 1895 he was in charge of the smelting and refining plant of the Mine la Motte, near Frederichtown, Mo., which address is most familiar to entomologists, and from 1895-

Sincerely yours
J. D. Mowell

1905, General Superintendent of the Central Lead Company near St. Louis. In 1905 he suffered a nervous breakdown and retired from active work. He returned to his entomological studies, in which he had been interested since his fourteenth year, in 1909 and was connected with the Federal Bureau of Entomology, as expert and collaborator in Cereal and Forage Insect Investigations until shortly before his death.

Mr. Monell was prominent as an engineer and an authority, more especially on lead poisoning, and his name was on the rolls of many engineering and other fraternities. He was also a member of the St. Louis Academy of Science and the St. Louis Entomological Society.

As a student, Mr. Monell was a leader. At the age of ten he could translate Latin and French and at fourteen was an ardent student of nature, and his interest in botany and entomology, which he acquired at this time, remained with him throughout his life. He was a keen observer and was especially interested in the Aphididae, in which group one genus and several species were named for him. He was a co-worker with Riley and Pergande, when the former was State Entomologist of Missouri, and was an early contributor to entomology, publishing his first paper, describing a new genus of Aphididae, at the age of seventeen. His largest paper (*Part II. Notes on Aphidinae with descriptions of New Species*) describing 27 new species of Aphids was written at the age of nineteen, and included in a paper *Notes on the Aphididae of the United States with descriptions of new species occurring west of the Mississippi River* by C. V. Riley and J. Monell. Part II was entirely Mr. Monell's work. His writings were clear and concise and most of the Aphids which he described as new, today stand as good and distinct species. After becoming engaged as mining engineer, he found it impossible to continue actively in insect work, although he was a constant correspondent of Lichtenstein, Pergande, and other prominent aphidologists in the early 80's and his large collection of Aphididae made during his career as an engineer is evidence of his great interest in the study. Although his published writ-

ings were few and confined to the early part of his life, his knowledge of Aphids was remarkable and his unselfishness in sharing this knowledge with his co-workers and his good-natured willingness to help anyone and everyone who applied to him for aid, places him high as a scientist. Besides the papers listed below, Monell contributed short items to most of the early American entomological publications and he has, because of his willingness to share his knowledge with others, become a contributor to many of the important papers on Aphididae. As Professor F. M. Webster has so aptly said, "Entomology has certainly sustained a serious loss as he seemed to have an inexhaustible fund of knowledge which he was always ready to impart freely to anyone whom he could assist in any way."

In 1914 Mr. Monell suffered a stroke of paralysis, and, six months later, a second stroke left his entire lower limbs helpless, although his arms and brain were perfectly normal for he mounted a slide of Aphids as late as April, 1915. Asthma, brought on from hardening of the arteries, caused his death.

He married Nellie Gifhorn September 30, 1881, who survives him, and who bore him five children, of whom three, all of St. Louis, survive him.

The Monell collection of Aphididae, which contains most of the American species, as well as many types—all on slides in balsam—and his complete notes on most of the mounts in the collection, will eventually be deposited in the United States National Museum.

Monell published the following entomological papers, describing one new genus and 32 new species:

A new genus of Aphididae. (*Can. Ent.*, Vol. 9, No. 6, June, 1877, pp. 102-103. Reprinted in *The Valley Naturalist*, Vol. 1, No. 1, Jan. 1878, p. 2.)

Describes *Colopha* nov. gen., giving *C. ulmicola* Fitch as type species, and straightens out the generic tangle.

A new species of Lachnus. (*The Valley Naturalist*, Vol. 1, No. 6, June, 1878, p. 21.)

Describes *Lachnus longistigma*, n. sp.

Notes on Aphidinae, with descriptions of new species. (*Bul. U. S. Geol. Surv.*, Vol. 5, No. 1, Pt. 2, 1879, pp. 18-32.)

The following new species are described (also redescriptions and notes on several other species): *Siphonophora achyrantes, S. calendulella, S. tulipae, S. tiliae, S. liriodendri, S. crataegi, S. sonchella, Aphis lutescens, A. calendulicola, A. hyperici, A. lonicerae, A. helianthi, Rhopalosiphum salicis, R. rhois, Callipterus ulmifolii, C. walshii, C. asclepiadis, C. discolor, C. punctata, C. hyalinus, C. betulaecolens, C. caryae, C. (?) quercicola, Chaitophorus viminalis, C. smithiae,* and *C. quercicola.*

The Japan lily Aphis. (Report of the Entomologist in *Ann. Rept. (U. S.) Comm. Agric.*, f. 1879 (1880), pp. 220-221. Reprinted in *The Valley Naturalist*, Vol. 2, No. 4, Dec. 1880, pp. 49-50.)

Describes *Siphonophora lilii*, n. sp.

Notes on Aphididae. *Can. Ent.*, Vol. 14, No. 1, Jan., 1882, pp. 13-16.

Notes on several species, together with descriptions of three new species, *Callipterus trifolii, Tetraneura graminis,* and *Pemphigus aceris.* Also a synoptic table of the genus *Callipterus.*

JOHN J. DAVIS, Lafayette, Ind.

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COVINGTON FEW SEISS died at his residence, 1338 Spring Garden Street, Philadelphia, September 5, 1915. He was the eldest son of the late Rev. Joseph A. Seiss, D.D., LL.D., L.H.D., a prominent Lutheran clergyman, and Elizabeth S. Seiss. He was elected a member of the Entomological Section of the Academy of Natural Sciences of Philadelphia, May 25, 1893, of the American Entomological Society, December 12, 1893, and of the Feldman Collecting Social, October 8, 1895. At that time and for some years following, he took an active part in the meetings of these bodies and in collecting local insects, especially Orthoptera and Hemiptera, as may be seen from the minutes published in contemporary volumes of the News. His literary activity was never very great, but Vol. VII of the News contains a paper by him on "The Breeding Habits of *Periplaneta orientalis*" (pp. 148-150, May, 1896), while Vol. VIII gives his brief list of Hem-

iptera on sunflower within the city of Philadelphia (p. 67, March, 1897). Prof. John B. Smith acknowledged the assistance which he derived from Seiss in the preparation of his Catalogues of the Insects of New Jersey (1900, p. 729; 1910, p. 846). Of late years, Mr. Seiss had dropped out of entomological activities altogether. His will bequeathed his book-box collection of insects to the Central High School of Philadelphia, and his reptiles, batrachia and fishes to the Academy of Natural Sciences.

Many of us recall Mr. Seiss's generosity in presenting to us desirable specimens of almost all orders of insects, which he obtained in his active collecting days, and we regret that we have seen so little of him in recent years in haunts entomological.

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The death of JULIUS MAX HAGEDORN, M.D., at Hamburg, on December 15, 1914, is announced in the *Deutsche Entomologische Zeitschrift* for 1915, heft II, page 213. He was born November 28, 1852, in Ratstal, near Gerdauen, East Prussia. He studied in the University of Königsberg, and settled in Hamburg, first as a general practitioner, later as a neck, ear and nose specialist. He contributed the sections on the Ipidae for the Coleopterorum Catalogus and the Genera Insectorum. His collection was presented to the Natural History Museum in Hamburg.

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The daily papers announced the death on August 20, in Havana, Cuba, of CARLOS JUAN FINLAY, promulgator of the yellow-fever mosquito fever in 1881. He was born in Puerto Principe, Cuba, December 3, 1833, and received the degree of M.D. from Jefferson Medical College, Philadelphia, in 1855 and from Havana in 1857. He was the delegate from Cuba to the International Sanitary Conference in Washington in 1881, and during 1902-8 was chief sanitary officer of that country. In 1903 he was Cuban delegate to the Sanitary Congress in Washington. Since January, 1909, he was the honorary president of the Junta National de Sanidad Beneficencia.

# EXCHANGES.

**Not Exceeding Three Lines Free to Subscribers.**

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

**I will name** specimens of Coleoptera in certain families. Correspondence with beginners desired. No specimens will be retained without permission of the owner.—C. A. Frost, 26 Pond St., Framingham, Mass.

**Wanted** Transactions American Entomological Society, Vol. IV; Entomological News, Vol. II, Nos. 6 and 10, or Volume.—Howard L. Clark, Hotel Puritan, Commonwealth Ave., Boston, Mass.

**I have a** number of duplicates of entomological Exp. Station Bulletins, Entomologist's Reports, Bureau Bulletins and Circulars, etc., for exchange or sale —Geo. G. Ainslie, 227 Peachtree St., Nashville, Tenn.

**Will exchange eggs** of *Hemileuca maia* for native or exotic Lepidoptera and Coleoptera and Cicindelidae. Send your lists.—Adolph Mares, 2524 So Homan Ave., Chicago, Ill.

**For Exchange**—*Catocala titania* Dodge for other species of same genus not in my collection. Send list and name terms to Ernst Schwarz, 6310 N. Newstead Ave., St. Louis, Mo.

**Wanted**—Six dozen cocoons *Cecropia;* 500 each Ova *luna* and *polyphemus*. Lowest price.—I Rushton, 10 Carlton Road, Worksop, Notts, England.

**Siphonaptera wanted.**—I desire to secure specimens of fleas from various parts of the world for determination. Host records important.—F. C. Bishopp, Box 208, Dallas, Texas.

**Wanted**—Showy American diurnals in papers, especially Papilios in numbers. Offered British Lepidoptera and Coleoptera and British colonial stamps.—A. Ford, 36 Irving Road, Bournemouth, England.

**Specimens collected**—Will collect in all orders this coming season — J. Burns, 1804 Tenth St., Sacramento, Calif.

**Wanted**—Transactions American Entomological Society, complete set, except Vols. 1 and 2; Entomological News, Vols. 2 and 6.—Wm. S. Marshall, University of Wisconsin, Madison, Wis.

**Many species** of butterflies and moths for exchange.—American Entomological Society, Logan Square, Phila., Penna.

**Desired**—Copies of the following publications: Cramer, Pap Exot.; Drury, Illustr. Ex. Ins.; Burmeister, Descr. Rep. Argent. V, 1878; Swinhoe, Cat. Lep. Het. Mus. Oxford, 1892. State price —B. Preston Clark, 55 Kilby St., Boston, Mass.

**Wanted** for cash or exchange—Neuroptera, especially Dobson, Stone and Caddice Flies; Hemiptera, larger species, *Belostoma*, Ambush Bugs, etc.; also *Papilio cresphontes, P. ajax, Act. luna, Cith. regalis, E. imperialis, Datana ministra, Anisota senatoria* and other Noxious and Beneficial Insects with their Life Histories, etc.—The Kny-Scheerer Co., New York.

**Wanted**—Live pupae of *Argynnis diana*.—C. W. Allen, 812 N. 7th Ave., Maywood, Ill.

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## Photographs of Entomologists Desired.

The Entomological Section of the Philadelphia Academy of Natural Sciences desires for its entomological album the photograph of every entomological student. The collection contains over 300 at this date. A list was published in the NEWS 1902, pages 45-47, of those in the album at that time. We hope that those who can do so will write their names and date of birth and the date when the photograph was taken on the back of each photo, along with any other information concerning themselves they may wish to impart.

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727.—**Ellis** (M. D.).—A new Halictine bee from the Northern United States. (Ent. News, **26**, 291-294, '15)..... .05

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729.—**Cresson** (E. T., Jr.).—Note on the Bombyliid genus Rhabdopselaphus Rond. (Pseudogeron Cress.). (Ent. News, **26**, 305, '15)..... .05

730.—**Johnson** (H. L.).—Coleoptera found in the vicinity of Meriden, Connecticut. (Ent. News, **26**, 307-319, '15.. .16

731.—**Wild** (W.).—Description of a new Coleophora moth and note on a synonym. (Ent. News, **26**, 320, fig., '15).... .05

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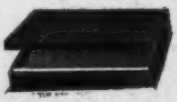

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